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Published:

— with international search report

(88) Date of publication of the international search report:
20 September 2001

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

RECEIVED
OCT 16 2001
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(54) Title: DETERGENT TABLET

(57) Abstract: A multi-phase detergent tablet for use in a washing machine, the tablet comprising: a first phase comprising alkalising agent, and a second phase comprising acidifying agent, and wherein the multi-phase tablet has an initial pH of at least 9, preferably at least 9.5 and a pH rate change index (Δ pH) of no more than about 0.15 units/min. Preferred are multi-phase detergent tablets wherein the alkalising agent is a silicate or mixture of silicates, especially a sodium silicate of the crystalline layered variety; while the acidifying agent is part of a (bi)carbonate/acid effervescent couple which acts as disrupting agent for the tablet. The multi-phase detergent tablets have improved pH control, cleaning and enzyme performance together with excellent product strength, integrity and dissolution characteristics.

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INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference CM1808/VB	FOR FURTHER ACTION see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, Item 5 below.	
International application No. PCT/US 99/ 15491	International filing date (day/month/year) 09/07/1999	(Earliest) Priority Date (day/month/year) 17/07/1998
Applicant THE PROCTER & GAMBLE COMPANY et al.		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 3 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

- a. With regard to the language, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

- b. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international search was carried out on the basis of the sequence listing:

☐ contained in the international application in written form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. ☐ Certain claims were found unsearchable (See Box I).

3. ☐ Unity of invention is lacking (see Box II).

4. With regard to the title,

☒ the text is approved as submitted by the applicant.

☐ the text has been established by this Authority to read as follows:

5. With regard to the abstract,

☒ the text is approved as submitted by the applicant.

☐ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the drawings to be published with the abstract is Figure No.

☐ as suggested by the applicant.

☐ because the applicant failed to suggest a figure.

☐ because this figure better characterizes the invention.

☐ None of the figures.

INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 99/15491

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 C11D17/00 C11D3/12

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 C11D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP 0 851 024 A (UNILEVER) 1 July 1998 (1998-07-01) page 4, line 30 - line 35; claims; example 1	1-9, 15
A	DE 44 04 279 A (HENKEL KGAA) 17 August 1995 (1995-08-17) column 13, line 17 - line 49; claims	1-8, 15
A	DATABASE WPI Section Ch, Week 198745 Derwent Publications Ltd., London, GB; Class D25, AN 1987-317677 XP002120587 & JP 62 225600 A (LION CORP), 3 October 1987 (1987-10-03) abstract	1
	-/--	

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents :

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

- *T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- *A* document member of the same patent family

Date of the actual completion of the international search

27 October 1999

Date of mailing of the international search report

11/11/1999

Name and mailing address of the ISA

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Authorized officer

Grittern, A

INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 99/15491

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	<p>EP 0 151 203 A (RICHARDSON GMBH) 14 August 1985 (1985-08-14) claim 1</p>	1

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 99/15491

Patent document cited in search report		Publication date	Patent family member(s)		Publication date
EP 0851024	A	01-07-1998	US	5783540 A	21-07-1998
			CA	2223467 A	23-06-1998
DE 4404279	A	17-08-1995	WO	9521908 A	17-08-1995
			EP	0743978 A	27-11-1996
			US	5900399 A	04-05-1999
JP 62225600	A	03-10-1987	JP	2066413 C	24-06-1996
			JP	6074440 B	21-09-1994
EP 0151203	A	14-08-1985	AT	45495 T	15-09-1989
			AU	569371 B	28-01-1988
			AU	3849785 A	15-08-1985
			CA	1245162 A	22-11-1988
			DK	57585 A	09-08-1985
			ES	540215 A	16-11-1985
			JP	1895728 C	26-12-1994
			JP	6015464 B	02-03-1994
			JP	61225116 A	06-10-1986
			NZ	211074 A	30-06-1988

REC'D 24 OCT 2000

WIPO

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INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference CM1808/VB		FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
International application No. PCT/US99/15491	International filing date (day/month/year) 09/07/1999	Priority date (day/month/year) 17/07/1998
International Patent Classification (IPC) or national classification and IPC C11D17/00		
Applicant THE PROCTER & GAMBLE COMPANY et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.



2. This REPORT consists of a total of 6 sheets, including this cover sheet.

- ☐ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☒ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☒ Certain defects in the international application
- VIII ☒ Certain observations on the international application

Date of submission of the demand 24/01/2000	Date of completion of this report 18.10.2000
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer Culmann, J-C Telephone No. +49 89 2399 8487 

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/US99/15491

I. Basis of the report

1. This report has been drawn on the basis of (*substitute sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments.*):

Description, pages:

1-68 as originally filed

Claims, No.:

1-15 as originally filed

2. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
☐ the claims, Nos.:
☐ the drawings, sheets:

3. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

4. Additional observations, if necessary:

III. Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non-obvious), or to be industrially applicable have not been examined in respect of:

- ☐ the entire international application.
☒ claims Nos. 1-3.

because:

- ☐ the said international application, or the said claims Nos. relate to the following subject matter which does not require an international preliminary examination (*specify*):

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/US99/15491

- ☒ the description, claims or drawings (*indicate particular elements below*) or said claims Nos. 1-3 are so unclear that no meaningful opinion could be formed (*specify*):

see separate sheet

- ☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed.
- ☐ no international search report has been established for the said claims Nos. .

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims 4-15
	No:	Claims
Inventive step (IS)	Yes:	Claims
	No:	Claims 4-15
Industrial applicability (IA)	Yes:	Claims 4-15
	No:	Claims

2. Citations and explanations

see separate sheet

VII. Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

see separate sheet

VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

III. Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

The subject-matter of claims 1, 2, 3, and that subject-matter of claims 5 to 15 inasmuch it relates to that of claims 1 to 3 is irremediably unclear, because:

- i) a tablet cannot have a pH; pH determination relates only to aqueous systems, not to solid ones;
- ii) even interpreting the feature "the multi-phase tablet has an initial pH of etc" as meaning the pH value determined after starting the wash process after 1 minute (see the description, the paragraph bridging pages 4 and 5), there is no mention of the water volume in which the tablet dissolves; obviously, a tablet cannot have any measurable effect if introduced in a huge amount of water;
- iii) as a consequence, the incriminated term relates not only to the result which is to be achieved by the claimed tablet, it furthermore depends on the volume of water in which the tablet is introduced, and since said volume is not specified, the relationship tablet/pH cannot be clear, as is *ipso-facto* the subject-matter of claims 1 to 3.

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step and industrial applicability

- 1. The problem to be solved by the Applicant is to achieve optimum pH for cleaning and enzyme performance as rapidly as possible (see on page 2, the last sentence of the antepenultimate paragraph).
- 2. The relationship between the rapidity with which the optimum pH value and the multi-layered structure of the tablet cannot be distinguished by the Examining Authority (nor - very likely - by the notional man skilled in the art). Said structure must thus be seen as totally irrelevant for the solution of the problem aimed at.

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/US99/15491

3. Document D1 (EP-A-0 851 023; not cited in the search report) relates to multi-layered tablets a first layer of which is alkaline, comprises a buffering material, and leads upon dissolution in water to a pH of 9.0 to 11.0. The second layer comprises an acidity agent and is preserved till a subsequent step (wherein the temperature makes this layer dissolves or disintegrates). That allows a delayed release of washing components as they are needed, the first layer dissolving during the pre-wash step, the second one during the bleaching/washing step.
 - 3.1. Buffering and building materials of the first layer are listed on page 4 of D1. Various silicates, phosphates and carbonates are cited.
 - 3.2. Tablet disintegrants, including effervescing materials, are discussed in D1 on page 9, lines 32 to 35.
 - 3.3. Considering the length of a pre-washing step, there is no doubt that the first layer dissolves very quickly. Though D1 does not specify how long is the time necessary for the dissolution step, a good idea thereof is given in the examples, wherein the pH measured after 5 minutes remains stable for the duration of the cycle (i.e. 5 minutes more). Admittedly the pH is not specified after 1 minute, it remains that the nature and the amount of the components of said first layer are such that it may reasonably be assumed that the pH after 1 minute is actually above 9.
 - 3.4. Compaction pressures are specified on pages 11 and 12 of D1; the first layer is compacted with a pressure of 500 to 3000kg/cm²; the second layer with a pressure of 100 to 3000kg/cm². It is commonly known that the compaction pressure has an influence upon dissolution.
 - 3.5. The subject-matter of claims 4 to 13 and 15 does not solve a problem not already addressed by D1, nor provides a solution for it which is not taught or suggested by D1. It thus lacks an inventive step.
 - 3.6. The subject-matter of claim 14 relates to the structure of the tablet, but since no

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/US99/15491

relationship between said structure and the problem faced is established by the Applicant, it cannot represent a contribution over the art of D1. This subject-matter also lacks an inventive step.

VII. Certain defects in the international application.

The documents referred to on page 32, line 8; page 32, the penultimate line of the second full paragraph; page 33, the last line; page 34, the last line of the first full paragraph; page 35, the last line; page 37, the antepenultimate of the third full paragraph; are not identified by their publication number.

The requirements of Rule 5.1 a) ii) PCT are not met, the document EP-A-0 851 023 is not identified in the description and the relevant background art disclosed therein is not briefly discussed.

VIII. Certain observations on the international application.

The subject-matter of claims 9 and 10 attempts to define the object for which protection is sought in terms of the effect to be achieved, not in terms of technical features resulting in said effect.

The subject-matter of claims 11 to 13 does not comprise any restriction about the pressure of compaction of the first phase: the upper limit which still allows dissolution should be specified.

PATENT COOPERATION TREATY

PCT

NOTIFICATION OF ELECTION

(PCT Rule 61.2)

From the INTERNATIONAL BUREAU

To:

Assistant Commissioner for Patents
United States Patent and Trademark
Office
Box PCT
Washington, D.C. 20231
ÉTATS-UNIS D'AMÉRIQUE

in its capacity as elected Office

Date of mailing (day/month/year)
01 March 2000 (01.03.00)

International application No.
PCT/US99/15491

Applicant's or agent's file reference
CM1808/VB

International filing date (day/month/year)
09 July 1999 (09.07.99)

Priority date (day/month/year)
17 July 1998 (17.07.98)

Applicant

BENNIE, Brenda, Frances

1. The designated Office is hereby notified of its election made:

☒ in the demand filed with the International Preliminary Examining Authority on:
24 January 2000 (24.01.00)

☐ in a notice effecting later election filed with the International Bureau on:

2. The election ☒ was
☐ was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO
34, chemin des Colombettes
1211 Geneva 20, Switzerland

Facsimile No.: (41-22) 740.14.35

Authorized officer

Diana Nissen

Telephone No.: (41-22) 338.83.38